

Giovanni MERRA Practice Cases

(Prepared for 2009 American Meteorological Society Short Course)

Two Giovanni instances supporting MERRA products have been added into Giovanni family recently. They are:

MERRA_MONTH_2D: Monthly data collection with 2-dimensional variable

http://gdata1.sci.gsfc.nasa.gov/daac-bin/G3/gui.cgi?instance_id=MERRA_MONTH_2D

MERRA_MONTH_3D: Monthly data collection with 3-dimensional variable

http://gdata1.sci.gsfc.nasa.gov/daac-bin/G3/gui.cgi?instance_id=MERRA_MONTH_3D

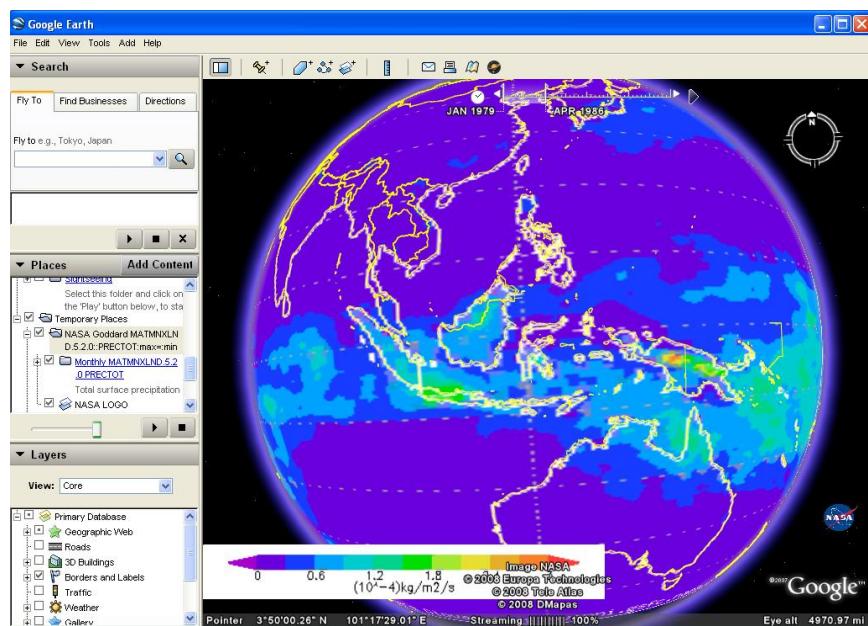
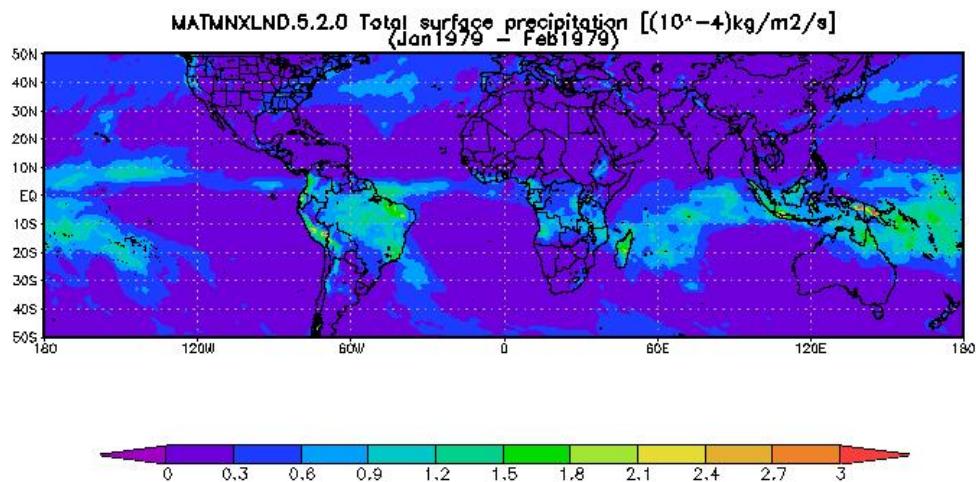
General features of the monthly MERRA 2D interface:

<http://disc.gsfc.nasa.gov/mdisc/> ➔ Tools ➔ Giovanni [MERRA_MONTH_2D](#)

- Spatial selection (layer selection, pan and draw features, drag box or enter longitude /latitude)
- Parameter selection (a total of six 2D collections; click on a parameter to see description, time coverage , collapse of group box, show units)
- Time selection
- Visualization function selection

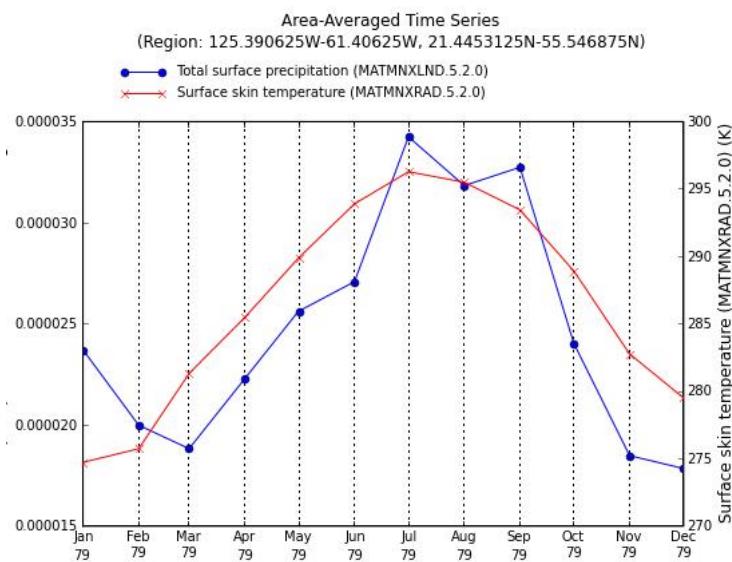
Case 1: Lat-Lon map Time averaged → Winter Precipitation

- **Area:** (180° W – 180° E, 50° S-50° N)
- **Parameter:** Total precipitation (in group: Land surface diagnostics)
- **Begin Date:** Jan 1979; **End Date:** Feb 1979
- **Select Visualization:** Lat-Lon map, Time averaged
- Click “Generate Visualization”, to process and generate the image
- On the Result page, modify Min/Max to (0, 0.0003), or color palette; note that the value has been scaled on the plot
- Click “Generate Visualization” to re-generate the image
- Click on “download data” at the top
- Click on “KMZ” icon to display through Google Earth



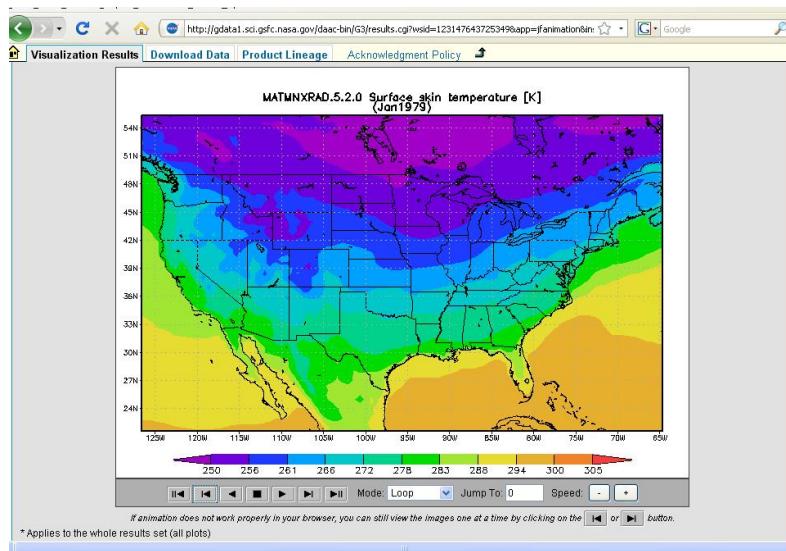
Case 2: Time series → Annual cycle of precipitation and surface temperature over U.S.

- **Area:** Select continental U.S. region
- **Parameter:** Total precipitation (in group: land surface diagnostics) and surface skin temperature (in group: surface and TOA radiation fluxes)
- **Begin Date:** Jan 1979; **End Date:** Dec 1979
- **Select Visualization:** Time-series
- Click “Generate Visualization”, to process and generate the image
- On the result page, edit Plot Preference “overlay lines”



Case 3: Animation ➔ See seasonal variation of surface skin temperature over U.S.

- **Area:** Select continental U.S. region
- **Parameter:** Surface skin temperature (in group: surface and AOT radiation fluxes)
- **Begin Date:** Jan 1979; **End Date:** Dec 1979
- **Select Visualization:** Animation
- Click “Generate Visualization”, to process and generate the image
- On the Result page: Modify color bar, set Min/Max (250/305) and plot again. This will make all images plot with the same data value range.
- Animation features: play, stop, control speed, loop, or swing, etc.



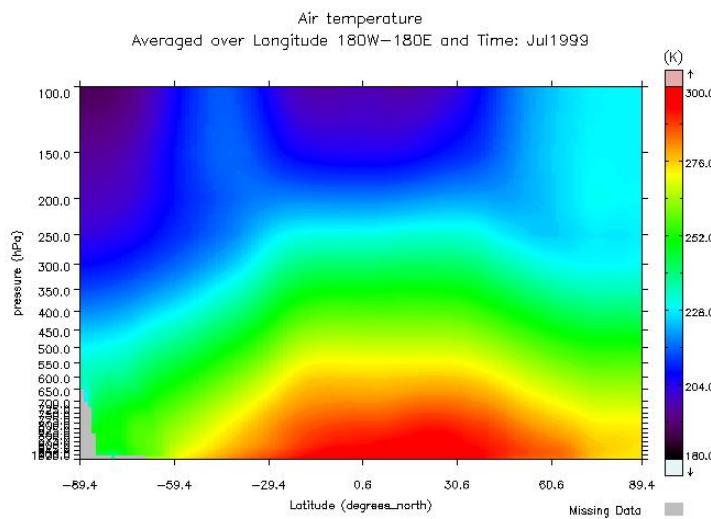
General features of the monthly MERRA 3D instance:

<http://disc.gsfc.nasa.gov/mdisc/> → Tools → Giovanni [MERRA_MONTH_3D](#)

- 3D interface has features of 2D interface plus:
- Vertical Profile: allows selection of vertical levels. Currently, averaging of levels (layers) is not supported.

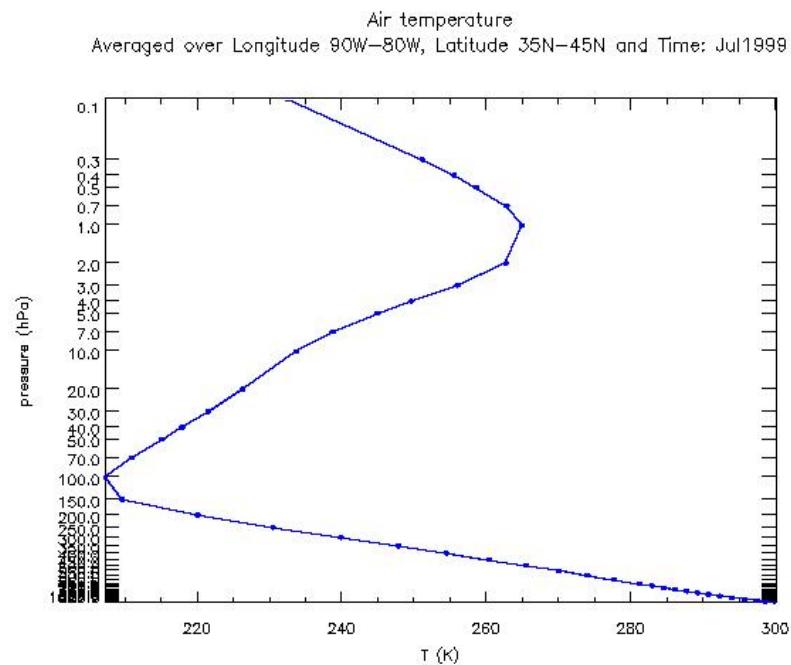
Case 4: Cross Map, Latitude-Pressure → Zonal mean vertical cross section of air temperature

- **Area:** global
- **Vertical Dimensions:** **Upper Level** = 100hPa, **Lower Level** = 1000 hPa
- **Parameter:** Air Temperature (in group: Basic assimilated fields from IAU corrector)
- **Begin Date:** July 1999; **End Date:** Jul 1999
- **Select Visualization:** Cross Map Latitude-Pressure



Case 5: Vertical Profile → vertical temperature profile over eastern U.S.

- **Area:** (90° W – 80° W, 35° N – 45° N)
- **Vertical Dimensions:** **Upper Level** = 0.1 hPa, **Lower Level** = 1000 hPa
- **Parameter:** Air Temperature (in group: Basic assimilated fields from IAU corrector)
- **Begin Date:** July 1999; **End Date:** Jul 1999
- **Select Visualization:** Vertical Profile



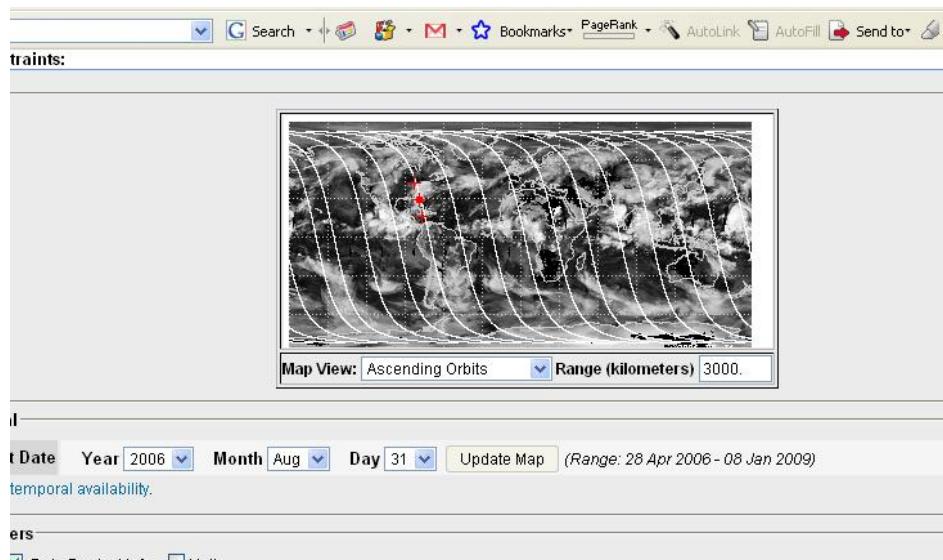
Case 6: A-Train Giovanni ➔ vertical structures of Storm Ernesto

(A preview of a future MERRA feature)

<http://giovanni.gsfc.nasa.gov> ➔ A-Train

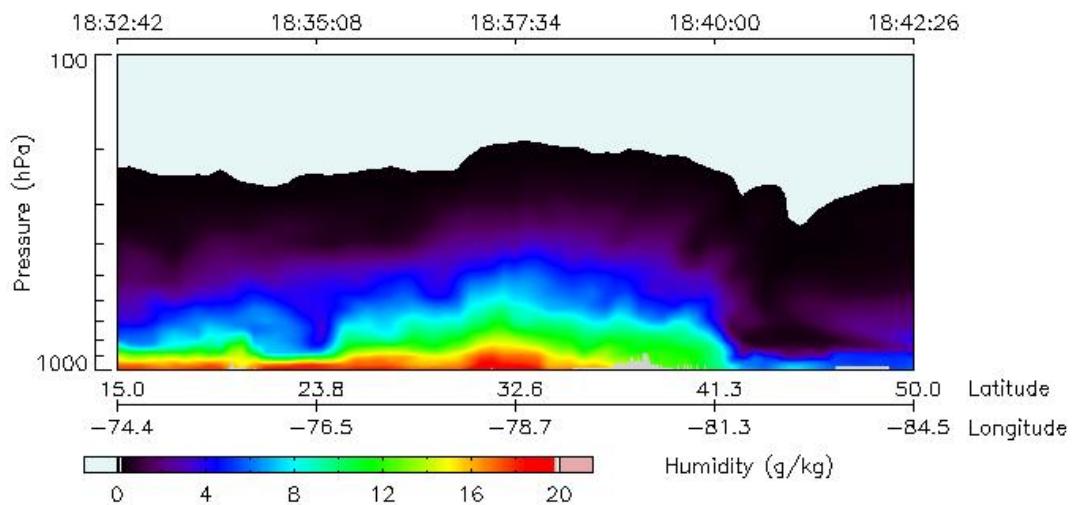
http://gdata1.sci.gsfc.nasa.gov/daac-bin/G3/gui.cgi?instance_id=atrain

- Select location on the track near U.S. (18° N-45° N, 80° W - 75° W, the red segment on the track). You may change the map view for selecting ascending, descending, or projection, and change the view range
- **Date:** Aug 31 2006
- **Parameters:** Specific Humidity Profile of ECMWF model in group Water Vapor, Reflectivity dBZ if CloudSAT in group Cloud
- Click on “Generate Visualization” to re-generate the image



Specific Humidity Profile (ECMWF model)

31-Aug-2006 18:32:42 – 18:42:26 GMT



Reflectivity dBZ (CloudSat)

31-Aug-2006 18:32:42 – 18:42:26 GMT

